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ORIGINALS
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Survey of oncohematological pharmaceutical care situation in Spain

Encuesta de situación de la atención farmacéutica oncohematológica en España

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Abstract

Objective: To learn about the baseline of Oncohematological Pharmacy Units in Spanish hospitals in order to identify areas for improvement.

Method: A survey in line with the objectives set in GEDEFO 2020 Strategic Plan of Pharmaceutical Care for oncohematological patients was designed. The survey was hosted on GEDEFO's website during March and April 2017. Activity data for 2016 was collected.

Results: A total of 95 hospitals responded to the survey. Out of which, 76% had an integrated information system of pharmacotherapeutic process management, where a variability in technological and organizational processes were found. The oncohematological pharmacist led the implementation of the principles of medicine, based on evidence and results obtained in routine clinical practice. It was shown that 88% of hospitals had standardized protocols. As for safety practices, in 83% of hospitals, oncohematological pharmacists actively participated in the development and maintenance of risk management program, implemented to prevent errors. Preparation was centralized in 89% of hospitals. Variability was observed in pharmaceutical care depending on where the patient was attended. In 92% of hospitals, pharmacists served as reference for Oncohematology, although with different levels of training. Major deficiencies were observed in training programs and teaching.

KEYWORDS
Survey; Pharmaceutical care; Pharmaceutical services; Patient safety; Quality healthcare.

Resumen

Objetivo: Conocer la situación basal de las unidades de farmacia oncohematológica de los hospitales españoles para detectar ámbitos de mejora.

Método: Se diseñó una encuesta acorde con los objetivos establecidos en el Plan Estratégico de Atención Farmacéutica al paciente oncohematológico del Grupo de Farmacia Oncológica de la Sociedad Española de Farmacia Hospitalaria (GEDEFO 2020). La encuesta se alojó en la página web de GEDEFO durante marzo y abril de 2017. Se recogieron datos de actividad del año 2016.

Resultados: Respondieron la encuesta 95 hospitales. Un 76% disponían de un sistema de información integral de gestión del proceso farmacoterapéutico, encontrándose variabilidad en los procesos tecnológicos y organizativos. El farmacéutico oncohematológico lideraba la aplicación de los principios de medicina basada en la evidencia y de los resultados obtenidos en la práctica clínica habitual, y se comprobó que un 88% de los hospitales contaba con protocolos estandarizados. En cuanto a prácticas de seguridad, en un 83% de los hospitales el farmacéutico oncohematológico participaba activamente en el desarrollo y mantenimiento del programa de gestión de riesgos aplicado a la prevención de errores. La preparación estaba centralizada en un 89% de los hospitales. Se observó variabilidad en la atención farmacéutica en función de dónde se atendía al paciente. En el 92% de los hospitales existía farmacéutico

PALABRAS CLAVE
Encuesta; Atención farmacéutica; Servicios farmacéuticos; Seguridad del paciente; Calidad cuidados de salud.

Of all oncohematological pharmacists, 53% had been a researcher over the past three years.
Conclusions: These results mark the starting point for Spanish Oncohematological Pharmacy Units to develop strategies for improving the quality of pharmaceutical care offered to oncohematological patients and led by GEDEFO, heads of service, and oncohematological patients themselves.

de referencia para oncohematología, aunque con distintos niveles de capacitación. Las mayores deficiencias se observaron en los programas de formación y docencia. Un 53% de los farmacéuticos oncohematológicos había sido investigador en los últimos tres años.
Conclusiones: Estos resultados marcan el punto de partida de las unidades de farmacia oncohematológicas españolas para el desarrollo de estrategias de mejora de la calidad de la atención farmacéutica ofrecida a los pacientes oncohematológicos liderado por GEDEFO, jefes de servicio y los propios farmacéuticos oncohematológicos.

Introduction

In recent years, there has been a change in the care provided by the oncohematological pharmacists (FOH by its Spanish acronym) to cancer patients. It has evolved, from being professionals focused on preparation and dispensing of medicines, into developing a model focused on the needs of oncohematological patients (POH by its Spanish acronym). This change has been made possible by FOH's own training and educational background, which has contributed to adding value by being integrated into the interdisciplinary team taking care of these patients, participating in committees and clinical sessions, and contributing to the organization of functional units with direct information and health education to the patients[1-3].

Many experiences show that FOHs who are integrated into these teams increase safety and improve health outcomes, through therapy selection and validation, interaction review, information and health education for patients and other practitioners, toxicity follow up and adherence monitoring, among other tasks[4-7].

In Spain, the oncological pharmacy group (GEDEFO by its Spanish acronym) of the Spanish Society of Hospital Pharmacy (SEFH) developed a Strategic Plan of Pharmaceutical Care for the POH (GEDEFO 2020). Six strategic areas were established, where targets are identified to provide quality pharmaceutical care and thus achieve the maximum clinical benefit, helping to efficiently improve health outcomes. This plan aims to promote the incorporation of organizational, technological and process changes in order to improve its organization and quality, as well as its safety and comprehensive care in the pharmacotherapeutic process for POH[8]. Concurrently, the strategic map of pharmaceutical care for outpatients (MAPEX) includes actions to address their present and future needs, POH being a very large group that is treated in outpatient consultations at the pharmacy department and oncohematological (OH) Day Hospital[9]. GEDEFO 2020-MAPEX OH arises from the idea of marking future directions for Spanish Oncohematological Pharmacy Units (SOPU), as did previously the 2020 Strategic Plan for SEFH. For this SEFH strategic plan, indicators for every strategic line were quantified by measuring the starting point in 2010 and setting the standard to be achieved by 2020 in order to see the evolution of hospital pharmacy[10].

The aim of this study was to determine the status of SOPU of Spanish hospitals in terms of organizational development, scientific evidence of clinical practice, implemented safety practices, quality pharmaceutical care, training, education, innovation and research in order to describe the current degree of implementation of the guidelines established in the plan, and consequently identify areas for improvement in the drug treatment process of the POH.

Methods

Observational study of two months in which a survey designed by the coordinators of GEDEFO 2020 in collaboration with the MAPEX OH group was developed. The survey was disseminated through SEFH and GEDEFO's electronic distribution lists, as well as through twitter going by @gedefo_sefh account. Access on SEFH's website was enabled during March and April 2017 for its completion.

The survey was divided into two parts. The first part studied profiles of participating hospitals, number of beds, annual patients under oral and parenteral antineoplastic therapy that received pharmaceutical care, antineoplastic preparations and annual mixtures and dispensations for outpatients clinic POH. Answers were based on data from 2016.

The second part closed questions were made for the survey to allow yes/no answers for each of the 42 objectives set in the 6 strategic lines of GEDEFO 2020[8], being divided into the following sections:

1. Organizational development: systems and implemented technology to manage the POH pharmacotherapeutic process, information systems available and degree of integration with other hospital systems, as well as support elements and systems to ensure traceability and safety.
2. Scientific evidence in clinical practice for evaluating and selecting drugs, protocolization and implemented clinical guidelines, and participation in the collection and analysis of health outcomes.
3. Implemented safety practices with actions aimed at improving the safety system when using drugs for OH.
4. POH pharmaceutical care for maximum clinical benefit, differentiating outpatients, hospitalized and treated in day hospital (DH) patients.
5. Training and teaching: FOH training and technical or nursing staff and degree of implementation of individualized professional development programs that cares for POH.
6. FOH participation in research and innovation projects.

Spanish hospitals were included, along with pharmaceutical SEFH partners that answered at least one question in the survey. As an exclusion criterion, receiving more than one survey per hospital was considered. Results were analyzed with Microsoft© Excel© 2011 program by the percentage of responses answered and the response rate for each option. Every answer was considered for the analysis of results, provided that at least one question had been answered.

Results

A total of 95 hospitals responded to the survey, with the following geographical distribution according to GEDEFO areas: In Catalonia-Balearic Islands 22 hospitals, 19 in Andalusia and Badajoz, 18 in Central-Canarias, 16 in Levante area, 14 in the North area and 6 in the Northwest area

Hospital characteristics are shown in table 1. Taking the central value of each interval as reference, set for number of patients seen with parenteral and oral chemotherapy in each hospital, it was estimated that the annual POH average was 1,201 ± 825 and 568 ± 450 respectively, ie 1,769 patients/year as a global average per hospital.

The results of the organizational development strategic line are shown in table 2. Note that 76% of hospitals stated to have a management information system for the pharmacotherapeutic process that went from prescription to administration or outpatient dispensing of OH drugs. Only 3% of hospitals were performing outcome assessment through an integrated information management system of all drugs. This percentage increased to 11% if this follow up was done exclusively for high-impact treatments.

Out of the involved hospitals, 85% actively assessed processes and selected OH drugs, with a 77% collaboration with Medical Oncology and Hematology departments in the development of protocols and clinical guidelines. Out of FOH, 63% actively implemented programs aimed at patients receiving a pharmacotherapy based on evidence, and 88% of hospitals had standardized protocols, including medication support (97%), maximum dose (77 %), adverse events (20%), interactions (19%) and dose modifications according to toxicity or organ failure (35%), among others.

Table 1. Hospital characteristics

	No hospitals
No. of hospital beds	
≤100	5
101-250	23
251-500	29
501-1,000	25
>1,000	13
No. of oncohematologic patients/year with parenteral chemotherapy	
≤500	22
501-1,000	24
1,001-1,500	16
1,501-2,000	9
>2,000	20
Information not available	2
No. of oncohematologic patients/year with oral chemotherapy	
≤250	28
251-500	20
501-1,000	28
>1,000	12
Information not available	5
No. of preparations/mixtures year chemotherapy	
≤10,000	33
10,001-15,000	13
15,001-20,000	19
20,001-40,000	17
>40,000	9
Information not available	2
No. of oral antineoplastic dispensations/year to oncohematologic patients	
≤2,500	33
2,501-5,000	29
5,001-10,000	11
10,001-15,000	4
>15,000	7
Information not available	9

A total of 18% of FOH has participated in the preparation or review of OH drugs assessment reports with the Grupo de Evaluación de Novedades, Estandarización e Investigación en Selección de Medicamentos (GENESIS), 33% with their Autonomous Region and 17% with the Ministry of Health.

In addition, 51% actively participated in the systematic collection and analysis of health outcomes, and favored access to record-based tools records and/or massive collection or either data management.

As for safe practices, in 62% of hospitals, the department responsible for risk management programs applied to preventing medication errors in oncohematology was indeed the hospital pharmacy service (HPS). FOH participated in 83% of hospitals for the review of medication errors, taking measures to improve processes and/or evaluating conducted activities. 90% participated in establishing procedures for safe handling of chemotherapy, considering not only risks for the patient, but occupational risks as well. 89% of central hospitals handled antineoplastic preparation, and 67% managed other non-antineoplastic dangerous drugs. Conciliation was incorporated as another safety practice, performing at 57% of outpatients, 40% of inpatients and 29% of DH patients.

Regarding the strategic line 4 of pharmaceutical care in SOPU, the survey results are shown in table 3. It should be emphasized that 42-67% of hospitals had a pharmacist with OH training, while in 53%, FOH was integrated into the support teams with defined responsibilities, and 92% had an OH pharmacist as reference.

The outcomes of the objectives of the strategic lines of training, teaching and research are shown in table 4. There, it is shown that professional development programs of FOH were only implemented in 16% of centers, and 28% had developed profiles for professional training, directed at staff handling HPS antineoplastic drugs.

Table 2. Survey results for the organizational development strategic line

Objective	Findings
1.1. Hospitals will count on an integrated information system for the management of the patient's OH pharmacotherapeutic process	76% (71/93)
Subprocesses including:	
– Prescription	100% (71/71)
– Validation	97% (69/71)
– Preparation	83% (59/71)
– DH programming	73% (52/71)
– Administration	75% (53/71)
– Ambulatory OH drug dispensing	76% (54/71)
1.2. Hospitals will count on an information system for the management of the patient's OH pharmacotherapeutic process integrated in the hospital's information systems	41% (38/92)
Subprocesses including:	
– Admission of patients	97% (37/38)
– Clinical analysis	66% (25/38)
– Pathological anatomy	45% (17/38)
– Clinic history	53% (20/38)
– Logistics systems	63% (24/38)
– DH Programming	76% (29/38)
1.3. Hospitals will count on an OH electronic prescription drugs system, with aid elements in decision-making	72% (66/92)
– Integrated in medical history	28% (18/66)
1.4. Pharmacy Services will count on an information system validation with aid elements in pharmaceutical care	60% (55/92)
– Integrated in medical history	19% (10/55)
– Aid Items available:	
Dose calculation based on anthropometric parameters	100% (55/55)
Biomarkers	15% (8/55)
Dose adjustment in clinical situations	64% (35/55)
Maximum doses	96% (53/55)
Supportive care measures	89% (49/55)
Indication	95% (52/55)
Decision Trees by pathology	44% (24/55)
Other	18% (10/55)
1.5. Hospitals will count on an integrated information system for the management of the patient's OH pharmacotherapeutic process that includes an assessment of therapy outcomes	
– Yes, in all drugs	3% (3/91)
– Yes, only in high impact drugs	11% (10/91)
– No	86% (78/91)
1.6. Pharmacy Service hospitals will count on a system that includes traceability and safety in the process of preparing OH drugs	33% (30/91)
1.7. Hospitals will count on a computerized OH drug administration system including aid elements aimed at reaching safety	38% (34/90)
1.8. Hospitals will count on an OH-ICT based drugs administration system including verification through bar code, DM or RFID and/or automated administration data transfer pumps	
– Have bar code, Datamatrix or RFID	32% (29/91)
– Automated administration data transfer pumps	9% (8/91)
1.9. Pharmacy Services have an information system and outpatient pharmaceutical care of the OH patient's pharmacotherapy with aid elements in pharmaceutical care, traceability and safety	76% (69/91)
Does the system contain any of the following elements?	
– Traceability aid	37% (25/68)
– To facilitate the prevention and monitoring of toxicities	49% (33/68)
– Aimed at ensuring patient adherence	68% (46/68)
– Aimed at ensuring proper health education to the patient	72% (49/68)
1.10. FOH will actively participate in the implementation of new technologies aimed at the proper patient education and facilitate greater patient empowerment, as well as their access to information about their own process. They include, for example, applications, mobile devices, teleassistance and platforms that enable communication channels with patients	19% (17/91)
1.11. Pharmacy Services will count on quality management systems certified by accredited or verified by external entities in the process of OH drug management integrated with the global or OH specific pharmacy system (validation, preparation and dispensing)	44% (40/91)
1.12. Human resources will be available, technology and the necessary structure to ensure proper operation of the OH pharmacy units, including the training of professionals	
– Count on OH pharmacy consultation	65% (59/91)
– Sufficient human resources	22% (13/59)
– Required technology	32% (19/59)
– Structure and adequate space	37% (22/59)

DH: day hospital; DM: datamatrix; FOH: oncohematological pharmacist; ICT: information and communication technology; OH: oncohematological; RFID: radio frequency identification.

Table 3. Survey results for the strategic line of pharmaceutical care

Question	Answer: YES (No. of hospitals)
At your center, does the pharmacist caring for the patient, have oncohematology training?	
– Pharmacist who serves the inpatient	53% (47/88)
– Pharmacist who serves the patient at DH	67% (59/88)
– Pharmacist who serves the outpatient	42% (37/88)
Is there a pharmacist in you center who serves as reference for oncohematology?	92% (81/88)
Is the FOH that serves as reference integrated in the assistance team, along with the established clinical responsibilities?	53% (40/88)
Is there a specific pharmaceutical center for hematology in your center?	51% (45/88)
Is the hematology pharmacist integrated in the healthcare team with the defined clinical responsibilities?	57% (24/42)
Is there a specific pharmacist for pediatric OH?	22% (19/88)
Is the OH pediatric pharmacist integrated in the healthcare team with the defined clinical responsibilities?	47% (9/19)
Does the FOH at your center validate all prescriptions prior to administration (including oral antineoplastic), considering the clinical data of patients and the approved hospital protocols?	
– For admitted patients	74% (65/88)
– For DH patients	93% (82/88)
– For outpatients	72% (63/88)
– Supportive therapy for outpatients	69% (61/88)
If there are admitted patients, does the FOH proceed with continuous pharmaceutical care to the OH patient and caregiver offering information about antineoplastic therapy?	6% (5/88)
– In initiation visits?	80% (4/5)
– In follow-up visits for selected patients?	40% (2/5)
– In all visits?	20% (1/5)
If there are DH patients, does the FOH proceed with continuous pharmaceutical care to the OH patient and caregiver offering information about antineoplastic therapy?	22% (19/88)
– In initiation visits?	84% (16/19)
– In follow-up visits for selected patients?	74% (14/19)
– In all visits?	26% (5/19)
If there are outpatients, does the FOH proceed with continuous pharmaceutical care to the OH patient and caregiver offering information about antineoplastic therapy?	69% (61/88)
– In initiation visits?	100% (61/61)
– In follow-up visits for selected patients?	66% (40/61)
– In all visits?	39% (24/61)
Do they use patient prioritizing mechanisms of patient who are candidates for pharmaceutical care?	33% (29/88)
Does your hospital count with support and antineoplastic treatment adherence?	27% (24/88)
If so, is it based on ICT?	42% (10/24)
Is the satisfaction of patients under PC periodically assessed?	48% (42/88)
Does the FOH participate in result assessment programs in order to learn its effectiveness, safety and results perceived by the patients?	30% (26/88)
Are you involved in continuity care programs by contacting health professionals from different levels of health?	31% (27/88)
Does your Pharmacy Service report pharmacotherapeutic monitoring or drug pharmacokinetics follow up in patients who need it?	35% (31/88)
Does your Pharmacy Service report pharmacotherapeutic monitoring or drug pharmacogenetics follow up in patients who need it?	6% (5/88)

DH: day hospital; FOH: Oncohematological pharmacist; ICT: information technology and communication; OH: oncohematological; PC: pharmaceutical care.

Table 4. Survey results for the strategic lines of training, teaching, research and innovation

Objective	Findings
LE 5. Training and teaching	
5.1. The Pharmacy Service will implement an individualized professional development program for FOH	16% (14/88)
5.2. Accreditation of specialized pharmacist in Hospital Pharmacy will be encouraged in the area of OH pharmacotherapy specific training	
– No. of pharmacists treating the patient with BPS-BCOP OH or similar:	
0	48% (42/88)
1	39% (34/88)
2	9% (8/88)
3	2% (4/88)
5.3. The Pharmacy Service will include within the FOH specific training, education of communication techniques and patient clinical interview	30% (26/88)
5.4. The Pharmacy Service will implement an individualized professional development program for technical staff and nurses that care for the OH patient	20% (18/88)
5.5. The Pharmacy Service will develop profiles that define professional training and skills that should have the technical and nursing staff caring for the OH patient	28% (25/88)
LE 6. Research and innovation	
6.1. At least one FOH in every hospital will have been principal investigator or collaborator of a research project in the past 3 years	53% (47/88)
6.2. At least one FOH in every hospital will have been principal investigator or collaborator of a public funded research project in the past 3 years	26% (23/88)
6.3. At least one FOH in every hospital will have authored a paper published in a journal included in the SCI in the last 3 years	
– Number of published papers:	
0	49% (43/88)
1-3	43% (38/88)
4-6	3% (3/88)
>6	5% (4/88)
6.4. The Pharmacy will actively participate in the establishment of technological innovation programs or processes	11% (10/88)

BCOP: Board Certified Oncology Pharmacist; BPS: Board of Pharmaceutical Specialties; FOH: oncohematological pharmacist; LE: strategic line; OH: oncohematologic; SCI: Science Citation Index.

Discussion

To our knowledge, this is the first time a survey is conducted to SOPUs in Spain aiming to see the degree of development and quality of pharmaceutical care under which patients are treated in these units.

The strong point of this study lies in the participation of Spanish hospitals that range in complexity, showing us a picture of the starting point that allows implementing actions that result in an improvement of pharmaceutical care and safety process.

A high degree of computerization of the pharmacotherapy management process was observed, but the level of integration with other hospital information systems, such as electronic medical records or HPS logistics system should be improved. Pharmaceutical validation is key to increasing patient safety[11]. The survey counted on 60% of respondents in a validation system with aid elements, where only 19% were integrated with the medical history. Therefore, FOH must access several different information systems for proper therapy validation –with the consequent chance of error in patient selection– which would stand out as an area for future improvement.

Effectiveness, safety and efficiency of a drug is known when used in clinical practice. The efficiency that is achieved in clinical trials is often superior to the effectiveness achieved in clinical practice[12]. This makes it necessary to measure health outcomes by re-evaluating the effectiveness of drugs under real conditions. Most of the hospitals surveyed did not have systems to measure results. Nevertheless, 51% admitted to participate in the collection and analysis.

In 2015, SEFH published "Report on the situation of hospital pharmacy services in Spain: infrastructure, resources and activity", where a descriptive analysis of information systems and quality as well as safety, with which the work is done in HPS[13]. There, it was found that 90% of HPS has a barcode system as an applied technology aimed at dispensing and drug traceability. However, among the interviewed SOPU, there were very few hospitals using technology for traceability and safety in the preparation, administration or outpatient dispensing. For this regard, Ortíz-Marin *et al.*[14] found that only 35.4% of hospitals in the Community of Madrid preparing intravenous chemotherapy have implemented bar code reading. These results are consistent with those obtained in this survey.

It was observed that FOH leads the application of the principles of evidence-based medicine, as well as the results obtained in routine clinical practice with the standardization of the protocols used. They also actively participate in the development of protocols and clinical guidelines based on scientific evidence, in collaboration with oncologists and hematologists.

Similarly, FOH leads safety practices implemented in hospitals, and actively participates in processes to prevent medication errors and increase safety in handling chemotherapy. The centralization of antineoplastic preparation should be increased to achieve greater safety for the handler[15]. It has also been identified the need to develop reconciliation programs to

incorporate them into the validation procedure. POH is a complex patient in which the reconciliation process can provide the same benefits as any other chronic patient. González Carrascosa *et al.*[16] showed that the implementation of a reconciliation program for DH POH decreased by 26% the reconciliation errors.

Recently, recommendations for safe handling of antineoplastic medication for cancer patients have been published. It consisted on a collaboration among SEFH, the Spanish Society of Medical Oncology and the Spanish Society of Oncology Nursing[17]. A list of safe practices were collected, with the commitment of all scientific societies to develop joint initiatives in order to increase safety in the treatment of POH.

Numerous national and international organizations suggest that pharmaceutical care for POH must be the same, regardless of the area where the patient is treated or if their medication is either oral or parenteral[8,9,11,18,19]. However, our results showed that there are differences if the patient is either seen in DH –patient with parenteral treatment–, is admitted or is an outpatient –patient with oral treatment or dispensing support at the HPS–. These differences appeared regarding validation before administration, continued availability of pharmaceutical care and the pharmacist's training who provides the aforementioned care. All these factors are areas of improvement. Prescription by the specialized practitioner and its subsequent validation by FOH increase safety in the patient, especially when it is done prior to its administration[11]. In this study, 93% of centers conducted this validation process by FOH for DH patients. However, there is a reduction of approximately 20% in hospitalized patients (74%) and outpatients (72%).

A survey conducted by Conde *et al.*, and on behalf of the GEDEFO group on safe practices with oral chemotherapy in Spanish hospitals[20], showed that only 26.8% (22/86) of pharmacists responsible for providing pharmaceutical care to patients under oral chemotherapy are FOH. Our results are better, since 42% of FOH caring for patients with oral drugs have OH training, although this percentage is less than that when patients are treated in DH (67%). This is due perhaps because this activity has been carried out in many hospitals by outpatient pharmacists, who, in addition, dispense drugs for many non-oncohematologic pathologies, and not all have OH training.

Other raised needs were to implement outcome assessment programs, to participate in continuity of care, or counting on adherence programs. These aforementioned adherence programs are being carried out only in 27% of hospitals, unlike other surveyed countries[21,22], where most hospitals claim to have some method to follow up adherence.

Only 33% of respondent hospitals use prioritization mechanisms or stratification of patients who are candidates for pharmaceutical care. Patient stratification according to the needs of pharmaceutical care, will allow us to transform our health care approach, which serves a guide for each patient's individual needs[23]. Currently, a study is underway through MAPEX OH-GEDEFO 2020 to establish a stratification model with demographic, sociosanitary, and treatment-related variables.

Training needs for SOPU staff have been detected, as 20% of respondents received a specific training program for technical and nursing staff, and 16% for pharmacists. These results are far from the objectives set in the 2020 SEFH's[10] Strategic Plan, where 95% of HPS hospitals must implement a program of individualized professional development for pharmacists, technicians and nurses.

Some scientific societies and governmental organizations recommend specific training that should have staff attending the POH[17,24,25].

Professional accreditation by the Board of Pharmaceutical Specialties is considered a world-level reference. Spain has a number of accredited professionals that is far superior to other European countries[26]. It is noteworthy that 48% of respondents have answered that there were no pharmacists with specific vocational training on oncohematology, especially considering that Spain is the second country with accredited pharmacists as Board Certified Oncology Pharmacist, after United States[27]. This perhaps due to the fact that almost all of the surveyed hospitals belong the public system, where there are no specific profiles in commodity markets, hence only general merits are considered.

Finally, as for research, although more than half of the centers (53%) have FOH as principal investigator or collaborator in a research project in the past three years, only 26% of these counted on a publicly funded research project. The complexity of obtaining a publicly funded research project is high, synergies with established and emerging groups are needed to improve these values.

This study has some limitations that must be considered. Firstly, the wording of some questions has been interpreted differently by various centers. Moreover, the same study design may induce bias arising from the lack of objectivity of the answers, which does not accurately reflect reality. Moreover, although a minority, some questions have been answered by a small number of hospitals.

Despite all this, the survey represents an approximate location of the SOPU situation in Spain.

In conclusion, the findings show a high level of development in SOPU regarding the use of scientific evidence in assessment and implemented security practices, showing more variability in other strategic areas. These results set a starting point to work on those targets that are farther from recommended to provide our patients a quality pharmaceutical care standard.

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Hospitals participating in the survey can know their results compared to other hospitals in the following link: http://formacion.sefh.es/cursos/plan_estrategico_farmacia_oncologica_2020/index

Conflict of interests

No conflict of interests.

Contribution to the scientific literature

This study can provide data on the overall situation of Spanish Oncohematological Pharmacy Units in terms of organizational development, scientific evidence of clinical practice, implemented security practices, quality pharmaceutical care, training, education, innovation and investigation. To our knowledge, this is the first time an overall view of the Spanish Oncohematological Pharmacy Unit is obtained and allows defining areas for improvement.

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